Age of an investor creates the highest difference in the behavioral biases

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Abstract

Behavioural Finance is a field of study the influence of behaviour biases on financial decision–making. It is a new field that seeks to merge cognitive and emotional biases with conventional economics and finance to provide explanations regarding investors' psychology. The purpose of this study is used to systematic literature review in the present study and based on three databases ABI/INFORMS, Emerald and Google Scholars. This study reviews 105 articles over the period 1981 to 2015. Literature reviewed of 35 years studies shown that out of total 70 percent studies dominating by **herding, overconfidence, and disposition effect** were least considered biases. Most of studies on behavioral bias pertained from European countries particularly the USA, the UK, and the Australia. This study is undertaken to examine equity inventor's behavioral biases with the help of a structured questionnaire. The chi-square results illustrate that there is dependence between investors' gender, age & education and their behavioral biases. The results also reveal that age of an investor creates the highest difference in the behavioral biases followed by gender and education of the investors.

Keywords– Behavioural Finance, Behavioural Biases, Herding, Over-confidence, Risk-Aversion.

1. Introduction:

Investment decision in the financial market is reflection of the economics and its performance. Due to globalization and privatization along with the new reforms in the financial market gave a new boost to the investment in the stock market. The decision to invest in the financial market will be based on the past performance, present working and expectation regarding future. Financial Market is influenced by flow of money and

information. Financial Market are said to be efficient if it absorb the information quickly. In the terms efficiency means the ability of the financial market react rapidly to new information. The flow of information is free. Very fast, and cost less. In such a manner, all the investor's behaviours are the some influence which is immediately reflecting in the share market price and no one gain extra profits so that any investor's entries in the stock market any time will have the same return.

In such a market scenario the demand and supply forces playing their role freely, the stock price are fair and move in a random manner. There are three type of information affecting the investor's behaviour, first is past price and trends, second is public information and inside information. Behavioural Finance is a field of study that investigates the impact of behavior on financial decision–making. Search for published journal articles on Behavioural Finance to cover a comprehensive and diverse range of articles for study.

Literature review is doing to identify gaps in the current body of knowledge, which justify future research area. Over the last 40 years, major research has occurred in the areas of investment and financial decision-making. Many concepts, theories, and related models are being employed successfully in financial investment decision making. In contrast, so far less focus has been paid to accumulate the literature in a systematic manner, particularly in the area of investors behavioral. In pursuance to fill the gap, we reviewed 438 scholarly research manuscripts published in database ABI/INFORMS, Emerald and Google Scholar.

The findings show that behavioral finance research has become more advanced and continuously increasing. A number of research articles have published in many countries including India in recent decades; rapid growth in the area is attracting the attention of researchers. This development enforced to review the literature. It needs systematic inquiry of articles published not only in a behavioral journal but also from other journals. The important questions are that how many countries and how many universities/institutions have contributed the maximum number of articles on behavioral finance, what are the trends of the area, what are the major area of research and which area need more attention (gap analysis) and so on.

BEHAVIORAL FINANCE DIMENSIONS

Importantdimensions of behavioral finance are explained below in order to understand the study:

Biases are shortcuts in the process of decision making require appropriate use of mental and financial resources. In the process of quick and easy financial decision-making investor tend to debate with rationality. These decisions are known as biases. These biases are systematic mistakes that investor themselves place on resources, cost, time, and capacity to process and assemble information about the investment. Ferande,*at. al.* (2009) categorized biases into two groups as cognitive and emotional. The various dimensions of cognitive and emotional biases areas which are supported by noted researchers in the area.

Overconfidence is a general human tendency to view the world in positive terms. It is a mistake of investors judgments that can lead to overestimation of own capabilities and at the same time underestimate the possible risk.

Herding (Group Behaviour) is the patterns of behavior that are interconnected across investors. Human beings have strong beliefs in group behavior. According to herding, investors do not trust their own information and knowledge and look for some other sources.

Disposition Effect the tendency of the investors to sell winning stocks too early and holding on losing stocks for too long time. These investor's behavior biases show the tendency of the investor to sell shares whose prices have increased, while keeping share that have dropped in value. In this investor avoid realizing losses and seek to realize again in the fianacial market.

2. METHODOLOGY OF LITERATURE REVIEW

Literature reviews identify theoretical trends in the field helps to identify gap for research. Reviewing a large number of research articles on investor's behavioral researcher endow with the categories of the area into various classification schemes. As described by Fink (2005), a literature review must use a methodology which is systematic in approach, explicit in describing the procedures and comprehensive in its scope of including all relevant material related to particular phenomena. Following Singh and Kumar (2013) we use Systematic Literature Review (SLR) methodology for this study.

The adapted literature review process for identifying the gap in behavioral biases research and categories in three phases as shown in figure-1

Literature Search and boundary identification: Search for published articles on Behavioural Finance in many databases to cover inclusive and diverse range of articles for review. In this study, we used the ABI/INFORM, Emerald and Goggle Scholar databases for search research articles. Started with a Keyword search and then delimited the literature thereafter. Initially, a large amount of literature was found by Keywords i.e. behavioral finance, behavioral biases, overconfidence, herding, and investors decision making etc. Because it was very difficult to review all found literature in the limited time period so, we develop some delimiting boundaries for screening the literature. These boundaries are as follow:

- Articles with full text available were considered
- Articles were collected for 35 years (1981-2015) and
- Only considered peer-reviewed academic research journal papers

Research articles including in the samples for future study are those who satisfied all listed delimiting conditions. Initially, the database search with delimiting boundaries resulted in more than 400 articles. After that, different processing steps were needed to ensure that identified research articles deal with the study area. This was done by reading the articles and thereby giving are selection on their appropriateness for the present study. After the detailed study, 138 articles were selected for the literature review. However, some articles presented in more than one database were removed.

LITERATURE REVIEW RESULT

Overview of Published Articles

A total of 138 research articles related to investor's behavioral is selected from different journals of three databases. Table-1 provides the list of top ten journals contributing a maximum number of research articles during the period of 1981-2015. Among the top list *Journal of Behavioural Finance, Managerial Finance*, and *Qualitative Research in Financial Market* are the most contributors followed by the *Eonstor*and *Judgment and Decision Making*.

Table – 1: Top Ten Journals Contribution in Behavioural Finance

1	Journal of Behavioural Finance
2	Managerial Finance
3	Qualitative Research in Financial Market
4	Eonstor
5	Judgment and decision-making
6	Financial Analyst Journal
7	Journal of Finance
8	Journal of Risk Finance
9	Journal of Risk and Uncertainty
10	International Journal of Economics and Finance

Major Studied Aspects of Behavioural Finance and Contribution of Databases

The selected articles on behavioral finance classified on the basis of herding, overconfidence and dispositional effect. These are the major factors affecting investor's behavior in investment decision making as identified by the researchers in the area.

As presented in Table-2, research articles were collected from ABI/INFORM, Emerald and Google scholar. There were 58 research papers collected from ABI/INFORM, 32 from Emerald and rest of 15 collected from Google Scholar.

As shown in the table-2, out of 105 selected articles are considering only one behavioral biases and dominated by ABI/INFORM with 58 articles.

Table - 2: Database wise and Behavioral Biases (one bias) Classification

FACTORS / DATABASE	Overconfidence	Herding	Disposition Effect	TOTAL	
ABI/INFORM	20	36	2	**58**	**55.23**
EMERALD	13	19		**32**	**30.47**
GOOGLE SCHOLLAR	7	8		**15**	**14.28**
TOTAL	**40**	**63**	**2**	**105**	**100**
	38.09	**57.14**	**1.90**	**100**	

As mentioned earlier most of the research studies were conducted by researchers considering only one behavioral bias and the major contribution of ABI/INFORM database. This provides a classification of various behavioral biases considered for the study individually. Herding (63) and Overconfidence (40) is grossly researched bias followed by a Disposition Effect.

From the above classifications it may conclude that overconfidence, herding are most studied biases, whereas, disposition effect are fewer research biases.

Table 3 present year wise classification of selected research papers. Classification shows that over the total period of 35 years (1981-2015) last 10 year (2006 -2015) registered a significant increase in behavioral finance research during this period 70 percent research paper were published in the databases, this increase was 2.35 times as compared to the

study in the previous years (1980-2005). This growth in this area is attracting the attention of researchers in behavioral biases particularly after a post-crash period of 2008.

Table - 3: Year wise and Behavioral Biases (one bias) Classification

Factors / Year	Overconfidence	Herding	Disposition Effect	Total	
1981-1985		1		**1**	**0.95**
1986-1990	1			**1**	**0.95**
1991-1995		4		**4**	**3.80**
1996-2000	2	2		**4**	**3.80**
2001-2005	5	9		**14**	**13.33**
2006-2010	13	12	2	**27**	**25.71**
2011-2015	19	35		**54**	**51.42**
Total	**40**	**63**	**2**	**105**	**100**
	38.09	**60**	**1.90**	**100**	

Table-3 shows year wise and behavioral biases (one bias) classification.

Country wise Contribution

Table shows that 73.75 percent articles contributed by eleven countries around the world. The major contribution (40 percent) is from the USA, 13 percent study from the UK, India's contribution is 8.66 percent followed by Germany 7.43 percent and Australia 7.12 percent.

Countries wise and Behavioural Biases Classification

Countries Contribution	Total	
Top 11 countries	78	73.75
Others Countries	27	26.25
Total	105	100

University /Institutional Contribution

Table shows University wise contribution in behavioral biases studies.

Table - : University /Institutional Contribution in Behavioural Finance Study

S.NO	UNIVERSITY/INSTITUTIONS	COUNTRY
1	UNIVERSITY OF CALIFORNIA	USA
2	CASS BUSINESS SCHOOL	UK
3	HARVARD BUSINESS SCHOOL	USA
4	UNIVERSITY OF TECHNOLOGY SYDNEY	AUSTRALIA
5	UNIVERSITY OF SFAX	TUNISIA
6	UNIVERSITY OF CHICAGO	USA
7	UNIVERSITY OF NEVADA	USA
8	UNIVERSITY OF MICHIGAN	USA
9	NATIONAL TAIWAN UNIVERSITY	TAIWAN
10	WASHINGTON STATE UNIVERSITY	USA
11	CALIFORNIA STATE UNIVERSITY	USA

12	**NORTHWESTER UNIVERSITY**	USA
13	**YALE UNIVERSITY**	USA
14	**MC MASTER UNIVERSITY**	CANADA
15	**MONASH UNIVERSITY**	AUSTRALIA

University of California (USA), CASS Business School (UK), Harvard Business School (USA), University of Technology Sydney (Australia), and University of Sfax (Tunisia) contribution is extraordinary. Further, only a few institutions from India contributed in the area. The major contributor from India is FORE School of Management.

The collected and selected research papers are dominating by secondary data (65 percent) whereas; the studies pertaining to use primary data are very less (31.27 percent). Over the period of last ten years registered the reverse trends means the studies of primary database increased more as compared to the studies using secondary data.

The majority (67.80 percent) of researchers studied individual behavioral biases over a period of 35 years. The institutional investors behavior comparatively less researched, reason being, it's very hard to approach institutional investors for collecting the data.

Data presents the different categories of reviewed articles based on types of research. Empirical studies (60.27 percent) were dominating among all categories followed by descriptive (15.52 percent) and conceptual (11.18 percent). Exploratory (9.38 percent) and analytical (3.65 percent) research designs were marginally adopted.

3. RESEARCH GAP

Behavioral finance considered in existing literature of ABI/INFORM, Emerald, and Google scholar databases, less number of the research studies considered three behavioral biases simultaneously. So, this study will focus on three behavioral biases. Reviewed studies shown that out of total 70 percent studies dominating by herding Further disposition effect (3.43 percent) were least considered biased. This systematic literature review given the holistic view of the behavioural biases. The detail analysis of every behavioural bias is beyond the scope of any meaningful future research. Therefore, the present study will concentrate on Herding, Overconfidence, and the disposition effect biases. Detail content analysis reveals that most of the research studies were empirical in nature, a few studies adopted exploratory research design.

Further, most of the research studies on behavioral bias pertained from European countries particularly the USA, the UK, and the Australia. There is a lack of studies of

Indian origin. This motivates us to study the behavioral biases of investors. The majority of researchers studied individual investor's behavior. So, this present study will also focus on individual equity investor's behavior. The research articles originated from India were using primary data and there are only a few studies considering secondary data for investigating behavioral biases. The select behavioral biases will be studied using primary data. Being majority of reviewed research articles on behavioral biases from European countries considered empirical research design. Further, most of the selected articles used traditional statistical analysis.

4. RESEARCH OBJECTIVES:

Present study examines the following objectives in the context of Indian Financial market using equity data set.

1. Explore the overconfidence in the Indian Equity Market.
2. Asses the presence of herding in the Indian Equity Market, and
3. Asses the presence of the disposition effect in the Indian Equity Market.

PRIMARY DATA

The respondents for this study are the equity investors in Delhi-NCR region. Delhi-NCR area is selected for the reason that per-capita income of this region is three times the national average making it the maximum in the country[1]. It also records the 60 percent of the trading volume in India[2]. This records show the average individual investors in this region economically eligible to invest in stock markets. The sample is decided on the basis of grouping of judgment and snowball sampling. The criteria for selecting the equity investors of the survey are as follows:

[1] Source: The Economic Times Survey 2012-2013. Available at: http://articles.economictimes.indiatimes.com/2013-09-12/news/42011594_1_capita-income-2-28-lakh-soundeconomic-situation

[2] Source: Business Standard. Available at: http://www.business-standard.com/article/markets/indian-equity-mktprovides-tremendous-opportunities-survey-110100700252_1.html

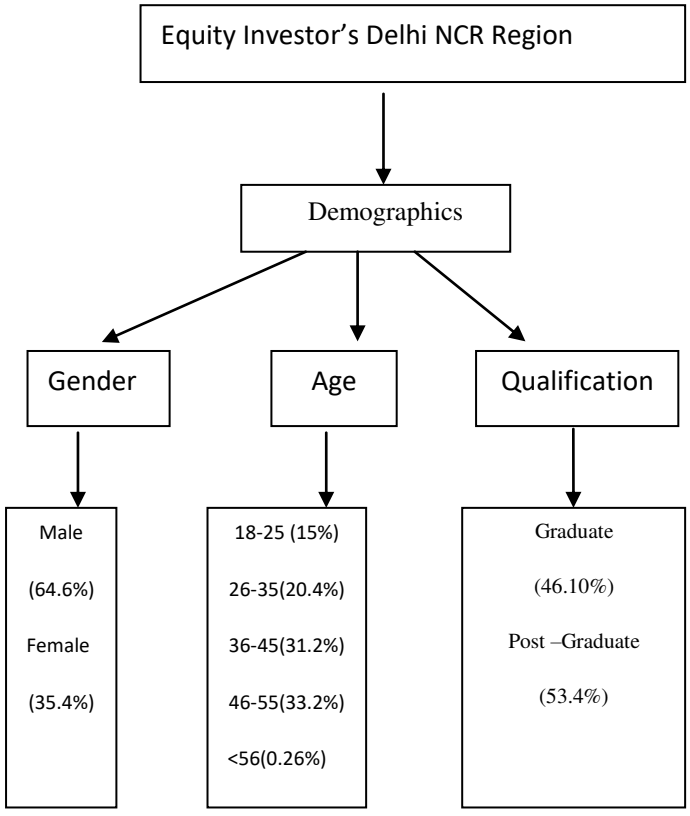
a) The equity investor's respondent should be a resident of Delhi-NCR region, and
b) The equity investor's respondent must invest in Indian equity market.

Around 450 investors were request for filling the questionnaire in this survey. This study was administered online as well as on personal basis. 410 equity investors responses were received out of which 9 equity investors responses were not completed in some way so, the final number of primary data to be 401.

RESPONDENT PROFILE:

The equity investors have been categorized on the basis of demographics, investor trading, and investor's frequency variables. The demographics variable includes age, gender, qualification, occupation and income. The percentage of the equity investor's respondents under each category of these variables is mentioned in this figure.

Figure: Data composition of equity investor sample



Survey instrument

This study is undertaken to examine equity inventor's behavioral biases with the help of a structured questionnaire. The questionnaire is finalized after judges' validity that includes academic and professional experts. Further, the reliability of the questionnaire is verified with the help of Cronbach's alpha.

Overconfidence (B1 TO B5)

Overconfidence can be measured are given by Awan (2010). We change these statements to make it applicable for the Indian situation. Questionnaire items capture the investors' perception of the sufficient knowledge (B1), take more risk (B2), would never hesitate to recommend investment advice to people (B3), trust his ability (B4), and confident of my ability to pick better stocks (B5).

Herding (B6 TO B9)

Equity Investors who agree to these statements have the tendency to follow the crowd. The herd mentality is also seen when investors buy stocks just because many "buy" orders were placed on that stock (B6 TO B13).

The Disposition Effect (B10 & B12)

Disposition Effect has been framed in the form of statements on Likert scale and the respondents are asked to agree or disagree to the same (B11 and B12).

Statistical tests

Statistical techniques used to analyze the responses collected with the help of a questionnaire. These tests aim at fulfilling the research objectives.

Chi-square test

These tests are conducted when independent variables are categorical. It shows the dependence of one variable on another categorical variable. The statistic technique used to test the statistical significance of the experimental association in a cross-tabulation.

It guides us in determining whether a systematic association presence between the two variables. It is used to compare the proportions between two or more groups at the same time. In this study, it has been conducted to check whether the responses to scenarios in Part A and Part B vary with each demographic and investor trading experience & trading

frequency variable. It signifies whether equity investor's decision-making process is independent of these variables. The null hypothesis to the test is:

H01. There is no dependence between gender, age & education and behavioral biases.

H02. There is no dependence between gender, age & education and behavioral biases

Results and interpretation

The results of the present study are based on the options that equity investors chose with respect to different situations. These choices subsequently unveil the underlying behavioral biases of investors.

Results of Cronbach's alpha

The reliability of each bias is checked separately. Results reveal that reliability of items overconfidence and herding is greater than the benchmark value of 0.70. The reliability of disposition effect is lower than the accepted standard. However, this study does not delete these items since they are in accordance with the literature on the disposition effect bias.

Reliability of behavioral biases verified with Cronbach's alpha value

Bias name	Cronbach's alpha value
Overconfidence	0.80
Herding	0.79
Disposition effect	0.54

RESULTS FOR CHI SQUARE TEST

The chi square results illustrate that there is dependence between investors" demographics and trading frequency & trading experience factors and their behavioral biases. The results also show that age of an equity investor creates the highest difference in the behavioral biases followed by trading frequency and occupation of the investors.

Chi-square test helps to detect the dependence between the behavioral biases and demographic and factors. The factors like gender, age, educational, occupation and

income level constitute demographics of the respondents. The remaining two variables are trading experience and trading frequency is also under these factors.

Gender: There is a significant difference in the responses of male and female for 16 items. These 16 items show all four biases in the purview of our study. The results are verified by significant chi-square value at the 5 per cent and the 1 per cent level. The present study shows that there is an association between male & female of the equity investors and their behavioral biases.

Age: The analysis shows that there is a strong association between the age and the behavioral biases of investors and is confirmed by significant chi-square value at the 1 per cent level.

Qualification: This variable has four categories that include undergraduates, graduates, post-graduates and doctorates. The investor's responses of only six items differ with each education class group. These six items still capture all the four biases. The results are significant at the 5 and 1 per cent level.

Table: Summary of Chi square tests

Demographic/ investor sophistication variable	No. of items with significant chi-square values
Gender	10
Age	16
Education	04

The chi-square results illustrate that there is dependence between investors' demographics and their behavioral biases. This association is confirmed for all seven variables and all three behavioral biases so that the null hypothesis H01 and H02 can be rejected. The results also reveal that age of an investor creates the highest difference in the behavioral biases followed by gender and education of the investors.

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Item no.	Behavioral bias
A1	
A2	Optimism/pessimism
A3	Optimism/pessimism
A4	Overconfidence
A5	Optimism/pessimism
A6	Overconfidence
A7	Optimism/pessimism
A8	Disposition effect
A9	Disposition effect
A10	Herding
B1	Herding
B2	Overconfidence
B3	Overconfidence
B4	Overconfidence
B5	Herding
B6	Overconfidence
B7	Disposition effect
B8	Optimism/pessimism
B9	Herding
B10	Disposition effect
B11	Disposition effect
B12	Control item
B13	Control item
B14	Herding
B15	Herding
B16	Herding
	Optimism/pessimism

Figure: chi – Square result

Gender			Age			Education		
Item	Chi-square	Significance	Item	Chi-square	Significance	Item	Chi-square	Significance
						B3	25.51	0.00
						B4	24.67	0.02*
						B6	47.54	0.00
						B11	23.63	0.0
B2	12.04	0.00**						
B3	14.88	0.00**	B5	90.3	0.00**			
B1	67.86	0.00**	B6	14.81	0.00**			
B2	96.46	0.00**	B9	9.66	0.05			
B3	67.77	0.00**	B11	15.73	0.00**			
B4	124.13	0.00**	B12	19.38	0.02*			
B5	72.73	0.00**	B14	12.02	0.02*			
B6	31.9	0.00**	B15	19.69	0.00**			
B7	47.89	0.00**	B16	11.07	0.03*			
B8	48.28	0.00**	B9	110.211	0.00**			
			B10	41.91	0.00**			
			B11	99.04	0.00**			
			B12	78.9	0.00**			
			B13	59.71	0.00**			
			B14	46.51	0.00**			
			B15	35.33	0.00**			
			B16	37.72	0.00**			

Notes: *Significant at the 5% level; **significant at the 1% level

Appendix 1. Questionnaire

Dear Respondent

This survey is to learn your views on investment pattern in general. Your responses will be kept confidential and used only for academic purposes. Please provide following information about yourself.

Part A

1. Name: _____
2. Age: _____
3. Gender:
   a. Male b. Female
4. Education
   a. Undergraduate b. Graduate c. Post-graduate d. Doctorate

(*continued*)

PART – B

Please answer the following questions by circling your preferred response where:

SD	D	N	A	SA
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1.	I have sufficient knowledge of Indian stock market.	SD	D	N	A	SA
2.	I am confident of my ability to pick believe stocks than others.	SD	D	N	A	SA
3.	I take full control and responsibility of my portfolio performance.	SD	D	N	A	SA
4.	Discussing my investment decisions with colleagues reduces my pressure of being successful.	SD	D	N	A	SA
5.	My past investment successes are attributed to my own skills and understanding.	SD	D	N	A	SA
6.	My past investment successes make me invest more in stocks	SD	D	N	A	SA
7.	I plan to increase my investment in stock market in next quarter	SD	D	N	A	SA
8.	I would increase my trading activity if the past trading volume of stock market was higher than usual.	SD	D	N	A	SA
9.	I prefer to sell stocks as soon as their price starts increasing.	SD	D	N	A	SA
10.	I prefer to keep holding on to stocks if their current market price is greater than their purchase price.	SD	D	N	A	SA
11.	I quickly dispose of the stocks whose price starts decreasing.	SD	D	N	A	SA
12.	I prefer to keep holding on to stocks even if their past performance is not very encouraging.	SD	D	N	A	SA
13.	I prefer to buy stocks if many "buy" orders were placed from the beginning of the trading session.	SD	D	N	A	SA
14.	My disappointment are losing money on an investment diminishes a litle if others have also experienced the same loss.	SD	D	N	A	SA
15.	I feel extremely disappointed if I take a contrarian position (opposite to the general trend) and lose while my friends make profits by following the crowd.	SD	D	N	A	SA
16.	If NSE drops by 3 percent, then it would recover within few days.	SD	D	N	A	SA